Claims

1. A surround-vision display system comprising:

a carrier structure having an internal circumferential surface;

a motor unit for effecting continuous movement of the internal surface of the carrier structure with respect to an observer located at least partly within a volume defined by the internal surface of the carrier structure;

a plurality of light emitting sources disposed as a two-dimensional array on the internal surface of the carrier structure; and

a driver unit for the plurality of light emitting sources for driving each light emitting source depending on its vertical location and its temporary horizontal location.

2. The system of claim 1, wherein the two-dimensional array of light emitting sources being tilted with respect to a vertical line across the internal surface.

3. The system of claim 1, wherein the two-dimensional array of light emitting sources covers substantially the entire internal surface.

4. The system of claim 1, wherein the two-dimensional array of light emitting sources comprises a plurality of panel tiles, each panel tile mounted on a portion of the internal surface and having a two-dimensional sub-array of light emitting light sources mounted on its surface facing away from the internal surface of the carrier structure.

5. The system of claim 4, wherein all tiles have an identical two-dimensional sub-array of light emitting sources.

6. The system of claim 4, wherein each panel tile comprises a plurality of driver elements mounted thereon, with one driver element for each of the light emitting sources of the two-dimensional sub-array.

7. The system of claim 6, wherein the driver elements are mounted on the surface of the panel tile facing the internal surface of the carrier structure.

8. The system of claim 6, wherein, the driver elements comprise pulse-width modulator structures for driving the light emitting sources.

9. The system of claim 4, wherein each panel tile further comprises an I/O unit, a digital signal processor (DSP), and a memory unit for storing frame buffer data.

10. The system of claim 4, wherein the tiles are arranged in one or more daisy chains, with each tile in one daisy chain being arranged as a repeater.

11. The system of claim 9, wherein the surround-vision system further comprises a control unit for supplying control data to the I/O units of the tiles.

12. The system of claim 11, wherein the control unit is stationary with respect to the moving internal surface of the carrier structure, and the surround-vision system further comprises a coupling unit for coupling the control data from the control unit to the I/O units of the tiles.

13. The system of claim 12, wherein the coupling unit comprises a first micro-strip element disposed in a manner such that it moves correspondingly to the internal surface of the carrier structure, and a second, stationary micro-strip element disposed adjacent to a surface of the first, moving micro-strip element and separated by a continuous gap, wherein the first and second micro-strip elements are configured as a hybrid coupler.

14. The system of claim 1, wherein the light emitting sources include pulse width modulators to control light amplitudes without color shifting.

15. The system of claim 14, wherein the system further comprises an aperture mask unit for sharpening a light emitting area of each LED.

16. The system of claim 15, wherein the aperture mask structure comprises a plurality of aperture mask elements, each aperture mask element disposed to reduce the light emitting areas of a group of the LED's.

17. A pulse-width modulator (PWM) for driving a light emitting diode (LED), comprising:

at least two counter elements for operation at different frequencies;

a register element associated with each counter element via an associated comparator element, and

an AND-gate element fed by the outputs of the comparator elements, whereby the output of the AND-gate provides a PWM driving signal for the light emitting source.

18. The driver element of claim 17, wherein the light emitting source comprises an LED and duty cycles are varied to effectuate light amplitude changes while avoiding color shifting.

19. A driver element for an LED, the driver element comprising a pulse-width modulator (PWM) structure for driving the LED, whereby an intensity of the LED is variable without wavelength shifts in the emission from the LED.

20. A coupling unit for transferring data to and from a moving component, the coupling unit comprising:

a first micro-strip element disposed in a manner such that it moves correspondingly to the component; and

a second, stationary micro-strip element disposed adjacent to a surface of the first, moving micro-strip element and separated by a continuous gap;

wherein, the first and second micro-strip elements are configured as a hybrid coupler.

21. The coupling unit of claim 20, wherein the first and second micro-strips are substantially circular and each have a transceiving line cut at one point and configured for transmission signals being fed and/or received signals being drawn from one end of each transceiver line.

22. The coupling unit of claim 21, wherein at least one of the micro-strips has its transceiving line cut at two or more points and further comprises a switch element for switching between the different sections of the transceiving line defined by the cuts in a receiving mode.

23. A surround-vision display system, comprising:

a rotatable drum with an inside surface viewable by a user;

a plurality of LED's arranged on said inside surface that together rotate in a vertical stack of horizontal circular orbits around said user;

a picture-frame pixel distributor connected to supply pixel information to a corresponding one of the plurality of LED's according to its position in said vertical stack and its instantaneous position in its flight in its horizontal circular orbit around said user; and

a pulse-width modulator connected to a corresponding one of the plurality of LED's and proving for modulated light intensity levels and minimal color shifts otherwise dependent on LED current levels;

wherein, when the LED's and drum are moving, the image projected nevertheless appear to be stationary and a higher apparent resolution results from a limited number of LED's involved.

24. The system of claim 23, wherein:

the plurality of LED's are distributed amongst a plurality of panel tiles that populate said inside surface viewable by a user.

25. The system of claim 23, wherein:

the plurality of LED's are arranged on said panel tiles in a grid set with its rows on an angle with respect to said horizontal circular orbits such that each LED orbits in uniformly spaced parallel circular orbits.

26. The system of claim 23, further comprising:

an aperture mask with a corresponding aperture hole for each of the plurality of LED's and providing for a point light source smaller than that that would be observed by an unmasked LED.

27. A method of surround-vision display with a very high visual dynamic range, comprising:

distributing a limited number of LED's on the inside of a drum and then spinning that drum around a user;

wherein, pixel information for each horizontal position in space is sent to each corresponding LED that visits that position; and

wherein, even though the LED's and drum are moving, a projected image appears to be relatively stationary.

28. The method of claim 27, wherein:

the step of distributing is such that the LED's are arranged in a grid on a panel tile, and the panel tile is tilted slightly so each panel tile presents a continuous vertical stripe in a picture frame as all its LED's are swept by in the drum motion.

29. The method of claim 27, wherein:

the step of distributing is such that several panel tiles are stacked vertically inside a drum to all contribute to a whole height of the picture frame.

30. The method of claim 27, wherein:

the step of distributing is such that an entire inside circumference of a drum is populated with LED panel tiles to keep frame refresh rates up to avoid flicker while keeping drum rotation speeds down to reasonable levels.